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## ABSTRACT

5     An oxime is synthesized by ammoximation of a carbonyl compound. In stage (i) of the process, a carbonyl compound containing 6 to 20 C atoms is reacted with ammonia and hydrogen peroxide in the presence of a) an organic solvent that is a1) at least partly water-soluble, a2) stable under ammoximation conditions, a3) has a boiling point of higher than 100°C and/or is capable of forming a two-phase azeotrope with water, and b) a titanium-containing heterogeneous catalyst. After the reaction, the catalyst is separated from the reaction mixture.

10    The oxime is crystallized and separated from the reaction mixture. Water is removed from the remaining mother liquor, provided the mother liquor is a two-phase system in which one of the phases is an aqueous phase. Water or a water-containing two-phase azeotrope is distilled off from the mother liquor, while the distillation bottoms and, optionally, the predominantly organic phase of the azeotrope are recycled to stage (i).

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